

The United States of America



The Commissioner of Patents and Trademarks

Has received an application for a patent for a new and useful invention. The title and description of the invention are enclosed. The requirements of law have been complied with, and it has been determined that a patent on the invention shall be granted under the law.

Therefore, this

United States Patent

Grants to the person(s) having title to this patent the right to exclude others from making, using, offering for sale, or selling the invention throughout the United States of America or importing the invention into the United States of America for the term set forth below, subject to the payment of maintenance fees as provided by law.

If this application was filed prior to June 8, 1995, the term of this patent is the longer of seventeen years from the date of grant of this patent or twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

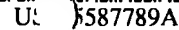
If this application was filed on or after June 8, 1995, the term of this patent is twenty years from the earliest effective U.S. filing date of the application, subject to any statutory extension.

Bruce Lehman

Commissioner of Patents and Trademarks

Pandra Morton

Attest



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[45] **Date of Patent:** Dec. 24, 1996

FOREIGN PATENT DOCUMENTS

0461649	12/1991	European Pat. Off.
0505985	9/1992	European Pat. Off.
0513744	11/1992	European Pat. Off.
3437182	4/1986	Germany
3831277	3/1990	Germany
4037178	6/1991	Germany

- Int's Organization for Standardization, ISO/IEC JTC1/SC29/WG11 MPEG 93/251, Mar. 1993, Jill Boyce et al.
- "Fast Scan Technology for MPEG Video Tape Recorders".

[57] **ABSTRACT**

[22] Filed: Apr. 13, 1994

An apparatus and method for controlling recording and reproduction in a video cassette tape recorder are disclosed. The apparatus is capable of, in a recording mode, separating specific data for speed-varied reproduction from compressed digital video signals, recording them on designated tracks, recording position information of the designated tracks on a control track by an index head or recording position information of recording position-synchronized blocks at the starting portions of the designated tracks recorded with the specific data, and in a speed-varied reproduction mode, controlling a capstan servo speed so as to maintain the travel of a magnetic tape at a normal speed and periodically or non-periodically accelerate or decelerate it where specific data for varied-speed have been recorded periodically or non-periodically on predetermined portions of tracks, thereby making heads travel repeatedly at the normal speed and the high speed and thereby detect continuously the specific tracks for varied-speed. A repeatability of reproduced video at a varied speed is obtained without any deterioration in picture quality, because of recording of the specific data for speed-varied reproduction and the continuous detection of the specific data in the speed-varied reproduction.

22 Claims, 10 Drawing Sheets

U.S. PATENT DOCUMENTS

4,651,227	3/1987	Yunoki et al.	358/335
4,663,673	5/1987	Doutsubo	360/10.2
4,802,019	1/1989	Harada et al.	358/335
5,057,949	10/1991	Suga et al.	360/10.2
5,122,886	6/1992	Tanaka	358/335
5,150,210	9/1992	Hoshi et al.	348/411
5,239,418	8/1993	Tyler et al.	358/335
5,239,429	8/1993	Hoshi	
5,247,400	9/1993	Asai	358/335
5,335,125	8/1994	Nakatsu et al.	358/335
5,406,382	4/1995	Adachi	358/335
5,438,458	8/1995	Honjo	360/10.2